977,579

PATENT SPECIFICATION

DRAWINGS ATTACHED

977,579

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COMPLETE SPECIFICATION

Heat Exchanger

We, SERCK RADIATORS LIMITED, of Warwick Road, in the City of Birmingham, 11, a British Company, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to heat exchangers and has as its object the provision of a heat exchanger in a new or improved form.

In accordance with the invention there is provided a heat exchanger for transferring heat between two fluids, comprising a pair of tubes arranged co-axially one within the other and joined together at their ends so as to form a closed space between the tubes, an inlet and an outlet communicating with said space, one of said tubes being formed with a plurality of dimples distributed over its surface and engaging the other tube, and the dimples being arranged in axially spaced planes with the dimples in adjacent planes circumferentially staggered relative to one another.

The invention will now be more particularly described with reference to the accompanying drawings wherein:—

Figure 1 is an elevation, partly in section, of one example of a heat exchanger in accordance with the invention and

Figure 2 is a cross-section on the line 2—2 of Figure 1.

Referring to the drawings the heat exchanger shown comprises a pair of elongated tubes 10, 11 each of circular cross-section. The tube 10 is of larger diameter than the tube 11 and formed on its surface are a plurality of inwardly extending projections 12. The tubes conveniently have thin walls and the projections are formed by pressing steel balls onto the exterior surface of the larger tube 10 so as to cause projections in the form of dimples to extend inwardly from the interior surface. These projections are disposed in a series of axially spaced planes, with the projections of each plane being circumferentially staggered with respect to the projections of each adjacent plane. The smaller tube 11 is disposed within the larger tube 10 and the projections 12 formed on the latter engage the outer surface of the former, so that the two tubes are co-axial.

There is thus an annular space formed between the two tubes. Furthermore the tube 11 is flared at its ends the two tubes are sealed together at their ends leaving the ends of the inner tube open. The annular space is provided with an inlet 13 adjacent to one end of the heat exchanger and an outlet 14 adjacent to the other end. As shown said inlet 13 and outlet 14 are connected to the larger tube 10 and each extends in a direction perpendicular to the common axis of the tubes.

The heat exchanger described above may, for example, be used as an oil cooler for a liquid-cooled internal combustion engine, in which application it may be disposed within the header tank of the radiator of the liquid cooling system. The inlet 13 and outlet 14 of the heat exchanger would then be arranged to project from the header tank and would in use be connected to the oil system so that the oil to be cooled would pass through the annular space in the heat exchanger from the exterior of the tank. The radiator fluid would normally be somewhat cooler than the oil and would therefore act as a coolant for the oil, circulating both through the smaller tube 11 and around the larger tube 10 to carry heat away from the oil. The projections 12 formed on the larger tube increase the efficiency of the heat exchanger in that they increase the turbulence of the oil flowing through the exchanger.

In an alternative construction (not shown) the projections may be formed on the inner tube so as to extend towards and engage the outer tube. Further the tubes in either of these embodiments need not necessarily be of circular cross section.

Furthermore, a heat exchanger as above described can be used for transferring heat between any two fluids.

WHAT WE CLAIM IS:—

(1). A heat exchanger comprising a pair of tubes arranged co-axially one within the other and joined together at their ends so as to form a closed space between the tubes, an inlet and an outlet communicating with said space, one of said tubes being formed with a plurality of dimples distributed over its surface and engaging the other tube, and the dimples being arranged in axially spaced planes with the dimples in adjacent planes circumferentially staggered relative to one another.

(2). A heat exchanger as claimed in claim 1 in which the dimples are formed in the outer tube.

(3). A heat exchanger as claimed in claim 1 or claim 2 in which the ends of the inner tube are flared.

(4). A heat exchanger substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

MARKS & CLERK,
Chartered Patent Agents,
Agents for the Applicants.

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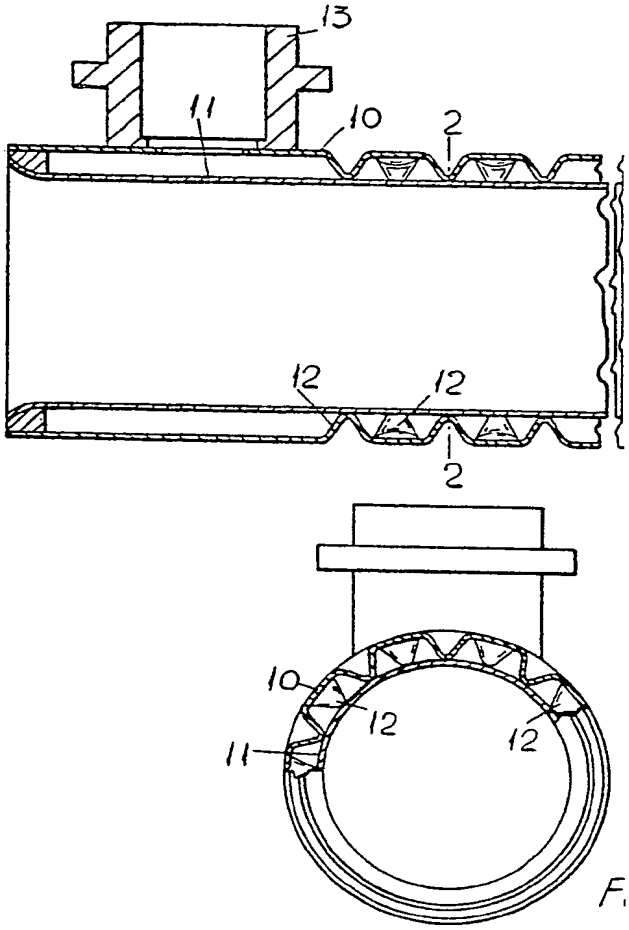

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977579 COMPLETE SPECIFICATION

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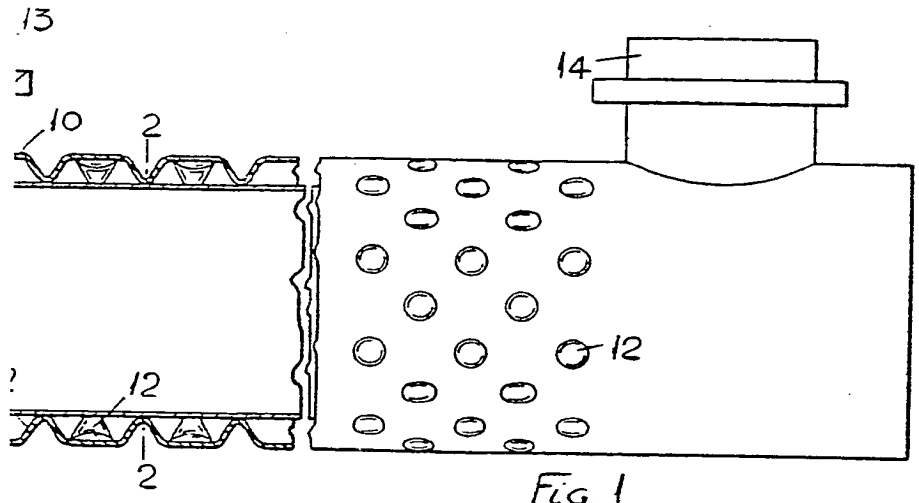

Fig. 1

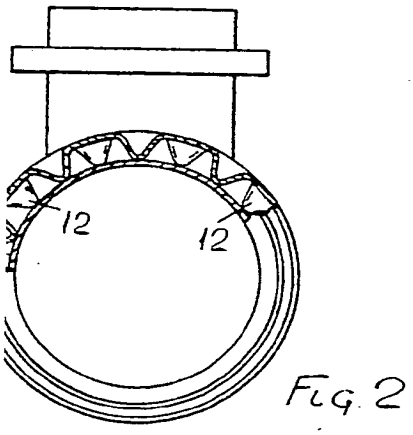

Fig. 2

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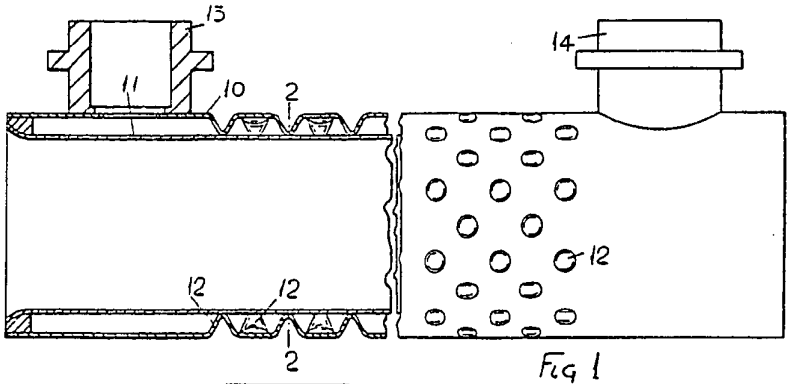

Fig 1

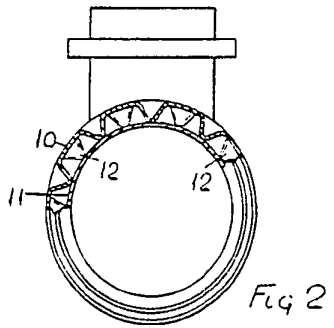

Fig 2